

Claims

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1. A composition comprising:

- (a) a peptide complexed with a copper ion; and
- (b) a basic amino acid.

10 2. A composition of claim 1, wherein said peptide

is of the formula 1:

R1

[>A1-A2-His-A3-A4-R3]_n : copper (II)

R2

15 Formula 1

20 wherein A1 is Gly or absent; A2 is Gly, Lys, Ala, Ser, or Val; A3 is Lys or Gly; A4 is Trp, (Gly)_n-Trp where n is from 1 to 4, Pro-Val-Phe-Val, Val-Phe-Val, or absent; each R1 and R2, independently, is H, C₁₋₁₂ alkyl, C₇₋₁₀ phenylalkyl, or C(=O)E₁, where E₁ is C₁₋₂₀ alkyl, C₃₋₂₀ alkenyl, C₃₋₂₀ alkynyl, phenyl, 3,4-dihydroxyphenylalkyl, naphthyl, or C₇₋₁₀ phenylalkyl; provided that when either R1 or R2 is C(=O)E₁, the other must be H; R3 is OH, NH₂, C₁₋₁₂ alkoxy, C₇₋₁₀ phenylalkoxy, C₁₁₋₂₀ naphthylalkoxy, C₁₋₁₂ alkylamino, C₇₋₁₀ phenylalkylamino, or C₁₁₋₂₀ naphthylalkylamino; and n is 1 or 2.

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30 3. A composition of claim 1, wherein said composition is an emulsion and further comprises a non-

ionic emulsifier and said composition is substantially free of ionic emulsifiers.

5 4. A composition of claim 2, wherein said composition is an emulsion and further comprises a non-ionic emulsifier and said composition is substantially free of ionic emulsifiers.

10 5. A composition of claim 1, wherein said composition is an emulsion and further comprises an oil soluble anti-oxidant.

15 6. A composition of claim 5, wherein said composition is an emulsion and further comprises an oil soluble anti-oxidant.

20 7. A composition comprising:
 (a) a peptide complexed with a copper ion; and
 (b) a non-ionic emulsifier,
wherein said composition is an emulsion and is substantially free of an ionic emulsifier.

25 8. A composition of claim 7, wherein said peptide is of the formula 1:

R1

[>A1-A2-His-A3-A4-R3]_n: copper (II)

R2

Formula 1

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wherein A1 is Gly or absent; A2 is Gly, Lys, Ala, Ser, or Val; A3 is Lys or Gly; A4 is Trp, (Gly)_n-Trp where n is from 1 to 4, Pro-Val-Phe-Val, Val-Phe-Val, or

absent; each R₁ and R₂, independently, is H, C₁₋₁₂ alkyl, C₇₋₁₀ phenylalkyl, or C(=O)E₁, where E₁ is C₁₋₂₀ alkyl, C₃₋₂₀ alkenyl, C₃₋₂₀ alkynyl, phenyl, 3,4-dihydroxyphenylalkyl, naphthyl, or C₇₋₁₀ phenylalkyl; provided that when either R₁ or R₂ is C(=O)E₁, the other must be H; R₃ is OH, NH₂, C₁₋₁₂ alkoxy, C₇₋₁₀ phenylalkoxy, C₁₁₋₂₀ naphthylalkoxy, C₁₋₁₂ alkylamino, C₇₋₁₀ phenylalkylamino, or C₁₁₋₂₀ naphthylalkylamino; and n is 1 or 2.

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9. A composition of claim 7, wherein said composition is an emulsion and further comprises an oil soluble anti-oxidant.

15 10. A composition of claim 8, wherein said composition is an emulsion and further comprises an oil soluble anti-oxidant.

20 11. A composition of claim 1, wherein said composition has a pH from about 6 to about 8.

12. A composition of claim 2, wherein said composition has a pH from about 6 to about 8.

25 13. A composition of claim 4, wherein said composition has a pH from about 6 to about 8.

14. A composition of claim 6, wherein said composition has a pH from about 6 to about 8.

30 15. A composition of claim 7, wherein said composition has a pH from about 6 to about 8.

16. A composition of claim 8, wherein said composition has a pH from about 6 to about 8.

5 17. A composition of claim 10, wherein said composition has a pH from about 6 to about 8.

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18. A composition of claim 1, wherein said peptide is $[H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-OH}}}_n\text{:copper(II) or } [H_2\text{-Gly}\text{-L\text{-His\text{-L\text{-Lys\text{-NH}_2}}}_n\text{:copper(II) and said basic amino acid is argenine, histidine, or lysine.}$

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19. A composition of claim 4, wherein said peptide is $[H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-OH}}}_n\text{:copper(II) or } [H_2\text{-Gly}\text{-L\text{-His\text{-L\text{-Lys\text{-NH}_2}}}_n\text{:copper(II) and said basic amino acid is argenine, histidine, or lysine.}$

20. A composition of claim 6, wherein said peptide is $[H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-OH}}}_n\text{:copper(II) or } [H_2\text{-Gly}\text{-L\text{-His\text{-L\text{-Lys\text{-NH}_2}}}_n\text{:copper(II) and said basic amino acid is argenine, histidine, or lysine.}$

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21. A composition of claim 14, wherein said peptide is $[H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-OH}}}_n\text{:copper(II) or } [H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-NH}_2}}}_n\text{:copper(II) and said basic amino acid is argenine, histidine, or lysine.}$

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22. A composition of claim 7, wherein said peptide is $[H_2\text{-Gly}\text{-L\text{-His}\text{-L\text{-Lys\text{-OH}}}_n\text{:copper(II) or } [H_2\text{-Gly}\text{-L\text{-His\text{-L\text{-Lys\text{-NH}_2}}}_n\text{:copper(II).}$

23. A composition of claim 10, wherein said peptide is $[H_2\text{-Gly-L-His-L-Lys-OH}]_n\text{:copper(II)}$ or $[H_2\text{-Gly-L-His-L-Lys-NH}_2]_n\text{:copper(II)}$.

5 24. A composition of claim 17, wherein said peptide is $[H_2\text{-Gly-L-His-L-Lys-OH}]_n\text{:copper(II)}$ or $[H_2\text{-Gly-L-His-L-Lys-NH}_2]_n\text{:copper(II)}$.

10 25. A composition of claim 1, wherein said composition further comprises a gelling agent.

26. A composition of claim 7, wherein said composition further comprises a gelling agent.

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